

WHAT IS CLAIMED IS:

1. An electric discharge machine for machining a workpiece in a desirable manner by applying electric discharge machining voltage between an electrode and said workpiece while feeding said electrode and said workpiece relative to each other to control a machining gap, said electric discharge machine comprising:

a spindle provided with attachment means for detachably attaching an electrode holder to said spindle;

said electrode holder having an engagement portion for engaging with said attachment means of said spindle and provided with electrode holding means for holding said electrode in said electrode holder;

an electrode guide holder including an engagement portion for engaging with said electrode holder and having attached thereto an electrode guide for supporting and guiding said electrode; and

electrode guide holder supporting means for supporting said electrode guide holder so that said electrode guide supports a distal end of said electrode, said electrode guide holder supporting means having gripping means for gripping said electrode guide holder and provided with moving means for moving said electrode guide holder in parallel to an axis of said spindle.

2. An electric discharge machine for machining a workpiece in a desirable manner by applying electric discharge machining voltage between an electrode and said workpiece while feeding said electrode and said workpiece relative to each other to control a machining gap, said electric discharge machine comprising:

a spindle provided with attachment means for detachably attaching an electrode holder to said spindle;

said electrode holder having an engagement portion for engaging with said attachment means of said spindle and provided with electrode holding means for

holding said electrode in said electrode holder;

an electrode guide for supporting and
guiding said electrode held in said electrode holder;

an electrode guide holder adapted to be
5 detachably attached to said electrode holder and having
said electrode guide attached thereto; and

electrode guide supporting means for
supporting said electrode guide, said electrode guide
supporting means having gripping means for gripping said
10 electrode guide or said electrode guide holder and
provided with moving means for moving said electrode
guide or said electrode guide holder in parallel to an
axis of said spindle.

3. The electric discharge machine according to
15 claim 1 or 2, wherein said spindle is attached to a
spindle head, so that said spindle can be moved in a
direction along the axis of said spindle and rotated
about the axis of said spindle as well as be positioned
at a desired position.

20 4. The electric discharge machine according to
claim 1 or 2, wherein said electrode holder has a flow
path formed therein for introducing working fluid into a
pipe electrode when said pipe electrode is held therein.

25 5. The electric discharge machine according to
claim 1, wherein said electrode guide holder supporting
means is attached to a suitable position on said spindle
head or a machine body and has gripping means for
gripping said electrode guide holder, so that the
electrode guide holder can be gripped by said gripping
30 means to move parallel to the axis of said spindle and
positioned at a desired position.

6. The electric discharge machine according to
claim 1 or 2, further comprising electrode holder
replacement means for transferring said electrode holder
35 between said spindle and an electrode magazine for
storing one or more electrode holders.

7. The electric discharge machine according to

claim 1 or 2, wherein said electrode guide holder has a tapered-shaped distal end opposed to said workpiece, on which said electrode guide is detachably mounted.

5 8. The electric discharge machine according to claim 1 or 2, further comprising an anti-vibration guide movable toward and away from a lengthwise middle portion of said electrode mounted on said spindle and capable of holding and guiding said electrode when moving toward said middle portion.

10 9. A method for machining a workpiece in a desirable manner by applying electric discharge machining voltage between an electrode and said workpiece while feeding said electrode and said workpiece relative to each other to control a machining gap, said method
15 comprising the steps of:

 (a) mounting an electrode guide or an electrode guide holder on an electrode holder having an electrode held therein in advance;

 (b) mounting said electrode holder on a
20 spindle manually or by electrode holder replacement means;

 (c) moving said electrode guide to a distal end of said electrode to support said electrode; and

 (d) moving said electrode and said workpiece
25 relative to each other to position said electrode at a position on said workpiece to be machined and start the electric discharge machining.

 10. A method for machining a workpiece in a desirable manner by applying electric discharge machining
30 voltage between an electrode and said workpiece while feeding said electrode and said workpiece relative to each other to control a machining gap, said method comprising the steps of:

 mounting on a spindle of an electric
35 discharge machine said electrode or an electrode holder having said electrode held therein;

 inserting said electrode into an electrode

guide or an electrode guide holder gripped by electrode
guide supporting means for supporting said electrode
guide movable parallel to an axis of said spindle so that
a distal end of said electrode is supported by said
5 electrode guide;

moving said electrode and said workpiece
relative to each other to position said electrode at a
position on said workpiece to be machined; and

applying electric discharge machining
10 voltage between said electrode and said workpiece while
feeding said electrode and said workpiece relative to
each other to carry out the electric discharge machining
on said workpiece.

11. A method for machining a workpiece in a
15 desirable manner by applying electric discharge machining
voltage between an electrode and said workpiece while
feeding said electrode and said workpiece relative to
each other to control a machining gap, said method
comprising the steps of:

20 holding said electrode in an electrode
holder;

mounting an electrode guide holder on said
electrode holder so that said electrode is inserted into
a electrode guide of said electrode guide holder;

25 accommodating said electrode holder in an
electrode magazine of an electric discharge machine;

taking out said electrode holder from said
electrode magazine by electrode holder replacement means
and mounting said electrode holder on a spindle of said
30 electric discharge machine;

releasing the mounting of said electrode
guide holder on said electrode holder and moving said
electrode guide holder parallel to an axis of said
spindle so that a distal end of said electrode is
35 supported by said electrode guide;

moving said electrode and said workpiece
relative to each other to position said electrode at a

position on said workpiece to be machined; and

applying electric discharge machining
voltage between said electrode and said workpiece while
feeding said electrode and said workpiece relative to

5 each other to carry out the electric discharge machining
on said workpiece.